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The primary problem of this study was to determine through a longitudinal study of persons differing in amount of higher education over a 2-year and a 4-year period, whether or not there were changes in personality characteristics associated with college education. The results are comprehensively discussed and supported by statistical references and tables. The report also includes a critical review of other research in the area of personality changes through higher education and a bibliography of 40 references.

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Personality Changes Associated With A College Education

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CHAPTER I

INTRODUCTION

Brief Statement of the Problem

The primary problem of this study was to determine, through a longitudinal study of persons differing in amount of higher education over a two-year and a four-year period, whether or not there were changes in personality characteristics associated with college education.

Rationale for Study of the Problem

What with the recent increase in the number and the proportion of young persons seeking higher education in the United States, the widespread declarations by political, social, and business leaders that the future of our political democracy rests on the adequacy of our educational program, and with increased demands upon public and private sources of financial support for our colleges, there has been a recurrence of interest in the question of what happens in college and to whom. This recurrence of interest has led to a relatively sudden behavioral science research focus upon college students as subjects of study in order to determine what happens in college and to whom. This research focus has, in the last decade, turned somewhat away from the questions of strictly intellectual, achievement, and occupational development to questions dealing with personality development or modification of students while in college. The question becomes what happens and to whom in terms of essentially non-intellectual as well as intellectual outcomes of a collegiate experience. This does not mean that investigators are no longer interested in the intellectual or occupational development of the college student; rather it means that the scope of the investigation has been broadened. There is more than adequate rationale for this broadening of research interest.

For many years, and in many instances since the inception of some colleges and universities, the declared functions of the college have been in both the intellectual and non-intellectual realm. Statements found in college charters, college bulletins, and in legislation providing for establishment of colleges have contained reference to essentially non-intellectual objectives or functions of the institution in question. Until relatively recently, little attention has been directed toward the determination of whether or not these functions or objectives of the college have been attained or approximated.

In addition, many behavioral scientists conceive of the human personality as undergoing change throughout the life span of the individual, and are continually investigating types of experience to determine the effect upon the personality of such experiences. The collegiate experience, though highly complex and different for different individuals, may well be one which has some effect upon the personality of the student which is widespread both within the student and between students.

Research motivated by the desire to determine whether or not collegiate experience has some general effect upon the personality development of students, or motivated by the desire to determine whether or not college objectives are being obtained seems to be warranted. Support for this conclusion can be found by citing the fact that an increasing number of agencies both public and private, and an increasing number of investigators are engaged in the stimulation of and carrying out of research upon the nature of the collegiate experience. The current study is one which was initiated to determine the nature of the collegiate experience upon a limited set of personality characteristics having to do with authoritarianism and intolerance.

Related Research: General to the Problem

At the time of initiating the current study, there was no comprehensive review of studies relating collegiate education with personality change in students. In their book on Experimental Social Psychology, Murphy, Murphy, and Newcomb (1937) did review the results of seventeen separate studies dealing with the effect of the manipulation of environmental variables upon attitudes. The studies reviewed had in common several features:

a. The studies dealt with highly specific attitudes (i.e., attitudes toward war, Negroes, prohibition, unemployment insurance, or birth-control).
b. The studies dealt with specific kinds of experience offered as causes of attitude change (i.e., special lectures, educational movies, reading materials, expressed opinions of experts, the expressed opinion of the majority, or short visits among persons toward whom prejudices were held).
c. The studies dealt with relatively short periods of time intervening between attitude measurement and re-measurement.
d. The studies did not employ control or comparison groups in the experimental design of the study.

The Murphy, et. al. review does indicate that the majority of these reported attempts at modification of attitudes was successful in producing desired attitude change, and that the stipulated experiences for bringing about attitude change were largely educational in nature. Some of the research reviewed dealt with the presumed effect of a particular college course upon attitudes, and the results reported were in the desired direction.

In the early 1940's, Newcomb (1943, 1948) undertook a study at Bennington College of the effect of the collegiate experience upon political and economic attitudes of Bennington students. He reports, in what has become a classic in this problem area of the "impact" of college, a significant change from freshman political and economic conservatism to senior non-conservatism. This change was attributed to the collegiate experience. The only other large scale studies available at the time of initiating this study which dealt primarily with personality changes associated with college experience were the early reports of the Mellon Foundation research at Vassar College (Sanford, 1955) and the extensive general education studies of Dressel and Mayhew (1954).

Bennington

At approximately the time of initiating the current study, the first major review of both published and unpublished research which dealt directly with personality changes and higher education was sponsored by the Hazen Foundation and published by Jacob (1957). Jacob's conclusions are many and they have had a pronounced effect upon those interested in the general problem. Jacob concluded that there are no significant changes in student values (attitudes, beliefs, opinions, values, and personality test score results are all referred to by Jacob as values) which can be attributed to the nature of the college curriculum, any particular general education offerings, any particular instructional methods, training of instructors, or educational materials. He further concludes that,

Jacob

> The main overall effect of higher education upon student values is to bring about general acceptance of a body of standards and attitudes characteristic of college-bred men and women in the American community. There is more homogeneity and greater consistency of values among students at the end of their four years than when they began. (Jacob, 1957, p. 6).

Jacob

Other general conclusions by Jacob do indicate that there are a few "potent" colleges for producing changes in values of students, but the implication is that for the majority of colleges the effect on student values is minimal.

A commentary by Marquis (1958) on Jacob's conclusions is instructive both on the status of research on the problem as of 1957, and on the breadth of research from which Jacob drew his conclusions. Marquis notes that,

> In a comprehensive review of research on Changing Values in College, Jacob found only two dozen studies of change in characteristics of students during their college years. Several of the studies spanned only one year, and others were based on use of a single test measure (Marquis, 1958, p. 28).

Marquis

The Jacob review has been criticized by Riesman (1958) on the grounds that the findings based upon women students are discussed by Jacob as if they would apply to men students (and vice versa), that Jacob's emphasis upon the similarity of values of college students probably masks changes attributable to college experience because college graduates do differ from non-graduates, and that the research reviewed by Jacob differs considerably in quality but is treated by Jacob without taking this into account. Webster (1958) reports results in detail from the Vassar research which tend to refute the Jacob conclusion that students become more homogeneous in values, attitudes, or beliefs from freshman to the senior year. Plant (1960b) has argued that Jacob used the incorrect statistics from the several studies to conclude that student values, attitudes, or beliefs become more homogeneous from the freshman to the senior year, and states that the issue is far from settled.

Riesman vs Jacob

Webster vs Jacob

Plant vs Jacob

Three additional reviews of relevant research have been published since the Jacob report. The two reports of the Social

Science Research Council Committee on Personality Development in Youth (Marquis, 1958; Bidwell, 1960) are reviews of research in progress or in the planning stage rather than reviews of published research. It is interesting to point out in this regard that both reports deal with research under way or planned almost exclusively at eastern, private, liberal arts colleges or universities and in select medical colleges.

Marquis
Bidwell

Freedman

Freedman (1960) writing on the *Impact of College*, and with particular reference to the Vassar research, reports substantial changes in personality from the freshman to the senior year. Vassar women over the four years change in a variety of characteristics including becoming more psychologically mature, more tolerant, more liberal in religious beliefs, and demonstrate greater acceptance of intellectual values. These results have been obtained with test and re-test results with the same subjects in a longitudinal design, have been obtained in studies of concurrent groups of students with test administrations to whole classes, and through intensive clinical interviews of subjects. Freedman also reports results from other women's colleges, and even though there are certain differences between the students at the other colleges and at Vassar . . . "nevertheless the same kinds of trends obtain between freshman and senior years" (Freedman, 1960, p. 20).

Webster, Freedman, and Heist (1962) have written the chapter in Sanford's *The American College* (1962) on personality changes in college students. This is an excellent treatment of the general problem of this study, and is the most up-to-date review and the most complete one available. In addition to the review, the authors have included a discussion of some of the important research problems inherent in such investigations. After reviewing the available research on personality changes and higher education, Webster, et. al. state that,

> In sum, researches on attitudes and values carried out prior to the end of World War II showed that, in general, students in college changed in the direction of greater liberalism and sophistication in their political, social, and religious outlooks. There was also evidence of broadening interests during the college years (Webster, et. al., 1962, p. 824).

When reviewing recent and contemporary studies, Webster, et. al. (1962, p. 825) state that . . ."actually, recent studies of particular attitudes and values have shown changes resembling those reported before 1945." As one reads the major studies which have been published and the reviews by Freedman (1960) and by Webster, Freedman, and Heist (1962) it is difficult to find support for many of the conclusions drawn by Jacob on Changing Values in College. It does seem that the majority of studies published, both before and after World War II, report changes in attitudes, beliefs, interests, or values of college students while in college.

Related Research: Specific to the Problem

In light of the fact that the current study is concerned with whether or not there are changes in intolerance and authoritarianism with increments of higher education, some review of research related to changes in these variables and to the variables themselves is needed.

What studies there are which are related to the current research have been published since 1950. Investigators have been interested in changes in prejudice, anti-intellectualism, dependency upon authority as opposed to relative independence of thought and action prior to 1950, but it was in that year that the study The Authoritarian Personality (Adorno, Frenkel-Brunswik, Levinson, and Sanford, 1950) was published. This, in turn provided scales for the measurement of the authoritarian and prejudicial characteristics of persons, the theoretical framework within which the scales were derived, and statistical and clinical validation for the scales and the theory. The publication of The Authoritarian Personality has probably served as a stimulus for more social psychological research than has any other such publication. This is attested to by the publication of a book on Studies in the Scope and Method of "The Authoritarian Personality" (Christie and Jahoda, 1954), and by reviews on the use of the scales developed in the study (Christie and Cook, 1958).

The early focus of the investigators of The Authoritarian Personality was on the problem of anti-Semitism, the personality characteristics associated with anti-Semitism, and the construction of a scale designed to measure anti-Semitism. The research then moved in the direction of determining whether or not anti-Semitism was related to prejudice and hostility toward other minority groups, and it was found that such was the case. The focus changed from anti-Semitism to ethnocentrism: the hostile rejection of outgroups and the acceptance of and glorification of ingroups. A scale for the measurement of ethnocentrism was developed, and it was found that subjects scoring high on the anti-Semitism scale also scored high on the ethnocentrism scale. The focus then turned to the development of a scale for the indirect measurement of prejudice without the explicit content of the ethnocentrism scale (that is, the elimination of group labels in the content of items), and for the measurement of personality predispositions toward an anti-democratic, or more particularly fascistic, outlook on life. The Fascism Scale, or F Scale was developed, and it was found that high scorers on the F Scale were found to be high scorers on the anti-Semitism scale, the ethnocentrism scale, and that they were politically conservative.

The F and E scales developed in this extensive study of general and specific prejudice and authoritarian outlook have been used in research on the effects of a collegiate experience upon students.

Forms of the F and E scales have been employed in the extensive research program at Vassar College. Webster (1956, 1958; Webster, et. al., 1962) has reported the results of the use of these scales in both longitudinal and concurrent classes studies at Vassar. In the studies of concurrent classes (comparing then freshmen with then seniors, etc.), the senior means on the F and E scales were always significantly lower than the means on the two measures for the freshmen. In the report of several longitudinal studies of freshmen retested as freshmen, of freshmen retested as sophomores, and of freshmen retested as juniors (Webster, et. al., 1962, pp. 832-834), it is stated that . . ."without exception there were always large decreases in mean scores on these characteristics (authoritarianism and ethnocentrism) between the freshmen and senior years." A replication of the study with similar subject groups, freshmen at Vassar retested later at stated educational experience intervals, yields the same results. It is quite clear that there is a significant decrease in authoritarian outlook and intolerance associated with a collegiate experience at Vassar. In commenting on these and other results from the Vassar studies, Freedman (1960) states . . . "the question of the representativeness of these findings is, of course, important," and, "....Of course, the similarities and differences between male and female students in the various characteristics previously described is at present an open question, one on which research is needed."

In a study designed to determine if there were differences in authoritarianism between students of different educational levels in different colleges, Brown and Bystryn (1956) obtained F Scale results from students in a Catholic liberal arts college for women, a nondenominational liberal arts college for women, and a large Eastern coeducational university. There were the expected differences between educational levels in the expected direction found at the two liberal arts colleges but not at the university. The differences in authoritarianism between freshmen and seniors were largest for Jewish students at the nondenominational college for women. It would appear that Freedman's questions about the generality of the Vassar findings do indeed need to be raised in light of the Brown and Bystryn results obtained from the Eastern coeducational university samples.

Foster, Stanek, and Krassowski (1961) have recently reported an extensive study of changing characteristics of students at the University of Santa Clara: a Roman Catholic university for men. In addition to other measures, the "Opinion Questionnaire" [1] used in the current study was made available to these investigators for use with samples in their study. Forms of the F and E scales were incorporated into this "Opinion Questionnaire", and certain results are thereby comparable for the Santa Clara male sample and our own male student sample. Foster, et. al. (1961) report on changes in F and E scale scores of 319 and 321 subjects respectively who were tested upon entry as freshmen in the Fall of 1960 and again in the Spring of 1961 while still freshmen. Mean scores on the F Scale were significantly lower over the period of time for the Catholic university male sample, but mean scores on the E Scale were not. The 1961 mean E Scale score was slightly higher than that of 1960, but the difference was not statistically significant. Here, again, is conflicting evidence regarding changes in authoritarianism and ethnocentrism with increments of higher education, and makes the question of generality from the Vassar research an important one.

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[1] See Procedures Chapter, Instruments Used section, for description of this booklet.

Dressel and Mayhew (1954) have conducted the most extensive study involving the presumed effect of a collegiate experience upon authoritarianism in students. The Inventory of Beliefs, a measure of authoritarianism developed for use in the Dressel and Mayhew studies of general education, was used with student groups at thirteen different and unidentified colleges. Student groups were tested with the Inventory of Beliefs, and then retested with the same instrument approximately one year later. Decreases in authoritarianism were reported for samples from eleven of the thirteen colleges, and there were differences between college means on the initial test and on the second test means which provoked the authors to counsel against strict comparisons between the institutions.

Though the psychometric scales used for the measurement of authoritarianism in the research by Dressel and Mayhew, Foster, et. al., and Brown and Bystryn are different, the findings all point to the problem of generalizing from results obtained from one college or university to other colleges or universities.

Plant (1958a, 1958b, 1958c) has reported on changes in ethnocentrism associated with two and four years of collegiate experience at San Jose State College. This research differs from that of others in that comparison groups were employed in the research design. It was found that students enrolled for two years of college had significantly lower ethnocentrism scale means after the two years, whereas students enrolled for part of the two years or not enrolled at all during the two years did not have significantly lower ethnocentrism scale means after the two years of time. The "on-campus" groups (enrolled two years) and the "off-campus" groups (enrolled for less than two years, or not at all during the two years) were not significantly different in measured ethnocentrism as freshmen or would-be freshmen. These results are similar to those obtained in the Vassar research, and for rather different types of student groups.

The general review of related research and the review of studies specific to the current one lead to the conclusion that there is substantial evidence to support the contention that there are measurable personality changes in students associated with increments of higher education. There are more results reported which indicate significant change than no significant change, although with respect to the authoritarianism and ethnocentrism variables there is an important question about generality of findings in light of conflicting results. As the current study deals directly with the authoritarianism and ethnocentrism variables it should add to the knowledge about these variables as they relate to collegiate experience. In addition, the current study offers a partial opportunity for replication of results obtained earlier at the same institution.

Methodological Problems

There have been several discussions made available on methodological problems inherent in research on personality changes in students. The Hazen Foundation (sponsors of the Jacob study) sponsored a monograph by Barton (1959) on methodological matters relating to the studies reviewed by Jacob in his book. From our point of view it is unfortunate that this monograph has not been as widely read as has the Jacob book.

The most important methodological problem discussed by Barton concerns itself with the matter of research design or the strategy of carrying out the research. Barton indicates that there are essentially four designs which might be used:

1. After-only studies: Survey data are obtained from subjects who have graduated from college, and these data are compared with data from the same sources obtained from subjects with less education.
2. Before-and-after comparison of exposed groups only: Survey data are obtained from subjects at one point in their educational program, and similar data are obtained from the same subjects at the end of their educational program.
3. Comparison of groups at different stages of exposure: Survey data are obtained at the same point in time from groups of subjects who differ in educational attainment at the time.
4. Before-and-after comparison of exposed and control groups: Survey data are obtained from a group of subjects, some of whom attain a given level of education later and some of whom terminate their education at or shortly after the original data are obtained, and all are retested at the same time later.

Design alternative numbered 4 above is the only one which comes close to providing information on the assertion that change in personality is a result of or is associated with a particular treatment or experience. Design alternative 1 may yield results which reflect pre-existing differences between groups which cannot be attributed to the educational experience. Design alternative 2 may yield results which come about as a result of wide social change which affects all or many persons, not just those in college. Design alternative 3 may yield results attributable to selective attrition from college and pre-existing conditions only, and not changes which can be attributed to the collegiate experience. It is only design alternative 4 which results in the reduction of or elimination of the sources of error indicated for the other alternatives. Even design alternative 4 falls short of the ideal design because of the self-selective characteristics involved in college entry and non-entry; there is no effective way of randomly assigning young persons to college and not to college.

In discussing design alternative 4, Barton (1959, p. 58) states . . .

> There appear, however, to be no examples of such studies; almost literally nothing is known of attitude changes among non-college young people after high school age and before voting age.

Marquis (1958, p. 29) discusses the problem of control groups by indicating that . . .

> A major difficulty in research design is the problem of demonstrating that changes occurring between freshman and senior years may be attributed to the college experience. It does not seem feasible to compose a control group of persons similar to college samples but who do not go to college. The outlook, however, is not hopeless. It is important to generalize about people who do go on to college, and even more valuable to study the different kinds of changes in similar students who enter different educational environments.

Investigators of personality change in college themselves have been concerned about the control group problem. At the Social Science Research Council's Committee on Personality Development in

Youth Conference on research progress and problems (Bidwell, 1960), the control group issue was raised in the section on Methodology chaired by C. R. Pace. In the Bidwell summary of this session one finds the following:

> The second important issue is the difficulty of clearly imputing personality change in a sample of college students to their college environment. ...Several suggestions were made for dealing with these matters.....In general, however, the participants seemed to feel that the suggestions did not deal adequately with the difficulty of controlled study of personality change in college.....Yet there was a clearly stated feeling that more adequate research design is essential (Bidwell, 1960, p. 56).

We have been fortunate in the current study to have available to us two different kinds of what we call comparison groups. Some young persons who apply and are admitted to San Jose State College do not enter the college. Some of these subjects, by their own declaration, do not enter and attend any other college or university either. Over the four-year period of this study we have viewed these as potential comparison or non-college subjects, and have sought their participation in this study. Of those admitted to the college as freshmen, a significant number do not finish the total number of semesters possible in a given time period. We have viewed these subjects as potential comparison subjects, too, and have sought their participation in this study.

The current study design comes as close to satisfying the demands of the alternative design 4 above as any of which we are aware. Because of the selective effect of attendance or non-attendance after admission, our groups are not control groups in the strictest terms and we have referred to them as comparison groups instead.

General Statement of Hypotheses Tested

Stated in null hypothesis form, the major hypotheses of this study were that:

A. There are no changes in authoritarianism or intolerance over a two-year or a four-year period of time for those enrolled in college for the two-year or the four-year period of time.

B. There are no changes in authoritarianism or intolerance over a two-year or a four-year period of time for those enrolled in college for some of the two-year or some of the four-year period of time.

C. There are no changes in authoritarianism or intolerance over a two-year or a four-year period of time for subjects who intended to be college students but were not during the two-year or four-year period of time.

CHAPTER II

PROCEDURES

Instruments Used

Four psychometric instruments or scales were employed in this longitudinal study of college students or intended-to-be college students. Three of the four scales were incorporated into a single booklet which was referred to throughout the study as an "Opinion Questionnaire," and it is from these scales that the major information of this study was obtained. The fourth scale was a widely used measure of scholastic aptitude, and it was included in the initial testing to provide control information if needed.

The "Opinion Questionnaire" was comprised of 100 items. Thirty of the items are from the original thirty-four item Total Ethnocentrism Scale: Public Opinion Questionnaire E (Adorno, et. al., 1950, pp. 110-111), thirty of the items are the Gough revision of the California F Scale (Gough, 1951a), and forty of the items are the Rokeach Dogmatism Scale: Form E (Rokeach, 1956). The decision was made to randomly select the items from the three scales for placement in the booklet until all 100 items were included rather than to include the scales intact in their original item order.

Although the three scales employed in this study have been widely used in research studies of samples of college enrolled groups and are widely known, because there are no norms or test booklet manuals available for any of the three, some discussion of the scales is in order. The discussion of each will take the same form: (a) citation of the original work, (b) indication of any modification of the original scale for use in this study, (c) reliability reports for the scales, and (d) sample reports of scale validity.

In light of the fact that this study dealt primarily with administering the same scales several times to the same persons and attaching significance to changes in scores over time, scale reliability is of major import. Change or difference scores are comprised of at least two sources of unreliability: unreliability of the first score, and unreliability of the second score. The higher the scale reliabilities, the more likely that differences obtained are related to some treatment or experience than to unreliable measurement. The necessity of including some information about scale validity is obvious.

The Modified California Ethnocentrism Scale: The E-Scale

The Total Ethnocentrism Scale was developed as a part of the study of The Authoritarian Personality (Adorno, et. al., 1950). It was developed to . . ."measure the individual's readiness to accept ethnocentric ideology or ethnocentrism as a whole" (Adorno, et. al., 1950, p. 109) where ethnocentric ideology or ethnocentrism is conceived as the tendency to categorize persons into groups and to attribute positive or negative (desirable or undesirable) characteristics to those grouped. The ethnocentric individual is said to judge or attribute characteristics of or to persons in terms of their perceived membership into groups, whereas the non-ethnocentric individual is said to judge the characteristics of individuals as individuals. The E-Scale has come to be called a measure of avowed prejudice because of the obvious content of many of the items. In this regard, the scale can be said to have face validity, but at the same time, the face validity makes for a probable increase in the likelihood of deliberate faking of response.

The modification of the California E-Scale used in this study was a modification to the extent of the elimination of four of the original thirty-four items. The four items were eliminated because of the judgement that they were out of date (i.e., item content dealing with the Japanese as war enemies).

The authors of the original E-Scale report that the split-half reliability of the scale, used with a sample of 144 University of California women enrolled in an introductory psychology course, to be .91. Other reports in the same source (Adorno, et. al., 1950) are for shorter versions of the scale, and all reported split-half coefficients are quite high. Locally obtained split-half reliability coefficients for a thirty-two item modification of the original E-Scale administered to groups of college freshmen are in the .80's, and stability coefficients over two years (Plant, 1958a) and over four years (Plant, 1958c) range from the middle .50's to the middle .60's. Odd-even, split-half reliability coefficients for a random sample of 400 male subjects and for a random sample of 400 female subjects from the current study and with the modified E-Scale under discussion were .87 in each case (Plant, 1960c). The available reliability evidence for the E-Scale seemed to warrant its inclusion in the study battery.

Validity information for the original E-Scale is reported by its authors. Clinical interviews of subjects were obtained, and those subjects established to be prejudiced in these interviews were also subjects with relatively high E-Scale scores.

The modified E-Scale was included in the test battery to provide information about student prejudice and possible change in prejudice over time, and because of the opportunity to replicate earlier local research.

The Gough Revision of the F-Scale

In an extensive study of social and ethnic intolerance, Gough (1951a, 1951b, 1951c, 1951d) employed thirty items taken from the California F and E scales. In reporting his research, Gough footnotes his indebtedness to Sanford (the senior research author of The Authoritarian Personality) for the use of the items. Most of the items were from a pool of items designed to be used in the California F-Scale, which in turn, was developed initially to measure prejudice or intolerance without the obvious content of the California E-Scale and the earlier anti-Semitism Scale developed by Levinson and Sanford (1944). By using clinically derived material obtained from prejudiced or intolerant subjects as the basis for item content which dealt with such topics as views of self, family, sex, moral and personal values, etc., a set of items was derived which correlated with the E-Scale and the anti-Semitism Scale but which did not include direct reference to minority groups or use group labels. The 30-item scale used by Gough was demonstrated to be correlated with the anti-Semitism Scale and other measures in a sample of 271 high-school seniors and serves as an independently derived validation of the work of the authors from whom the items were obtained (Gough, 1951a).

The odd-even, split-half reliability coefficients for a random sample of 400 each male and female subjects from the current study with the Gough revision of the F-Scale were .86 and .82 respectively (Plant, 1960c). This scale was judged adequate for inclusion in the battery to provide further evidence on student prejudice and intolerance at a more implicit level than from the E-Scale, and for measuring student anti-democratic predispositions.

The Rokeach Dogmatism Scale: Form E

As a key part of his systematic investigation of the nature of authoritarianism and of belief systems, Rokeach (1956, 1960) constructed several forms of a scale to be used in this research. One form of one scale has been used extensively by Rokeach and his students, and it is being widely used now in research on the nature of a collegiate experience. Form E of the Dogmatism Scale, or D-Scale, has been used in the "college impact" research by Iscoe and others at Austin College (Iscoe, 1960), by Lehmann and Ikenberry at Michigan State University (Lehmann and Ikenberry, 1959), by the research group at the University of Santa Clara (Foster, et. al., 1961), and in a study in six California public junior colleges (Telford and Plant, 1960). At this writing we have completed research reports only for the University of Santa Clara study.

Essentially, the D-Scale is said to be a measure of general authoritarianism like the familiar California F-Scale except that authoritarianism measured by the D-Scale is less linked theoretically and operationally with "rightist" or "fascist" authoritarianism than is the case with the F-Scale. In addition, the D-Scale is less linked with anti-Semitism, ethnocentrism, and political-economic conservatism than is the California F-Scale. It is possible then, argues Rokeach, to describe with the D-Scale the authoritarian "leftist" or the relatively unprejudiced authoritarian whereas with the F-Scale the authoritarian "leftist" or unprejudiced authoritarian would be seen as non-authoritarian. Various studies have been undertaken by Rokeach to test certain of these analyses of the nature of general authoritarianism as measured by the D-Scale.

Groups of English workers and English college students were administered the D-Scale, the F-Scale, and the E-Scale, and an analysis of the obtained inter-correlations between these scales was made. It was found in each of the group analyses that the D-Scale and E-Scale correlations were lower than were the F-Scale and E-Scale correlations. This was taken by Rokeach to indicate that the D-Scale was less linked with anti-Semitism and ethnocentrism than was the F-Scale. We have replicated this correlational analysis with samples of American college students and have reported similar results with both males and females (Plant, 1960a).

Rokeach's theorizing led him to conclude that Roman Catholic subjects and Communist Party Member subjects would be more authoritarian, dogmatic, or closed-minded than would members of other religious affiliation groups or of other political affiliation groups, but that the Catholics would be relatively high on the F and E scales relative to other religious groups and the Communist Party members low on the F and E scales relative to other political groups. When Rokeach predicted that Catholics and Communist Party members would both be highly authoritarian relative to other religious groups or to other political groups as measured by the D-Scale, but grossly different on the F and E scales, he established a test of the contention that the D-Scale is a better measure of general authoritarianism than is the F-Scale.

New York college student groups were given the D-Scale, the F-Scale, and a short form of the E-Scale, and were divided into religious affiliation groups. The Roman Catholic group had the highest means on the D-Scale, F-Scale, and E-Scale relative to the other religious groups. The same scales were administered to groups of

English college students divided into declared political affiliation groups. The English college student group of Communist Party members had the highest mean score on the D-Scale relative to the other political groups, and the lowest mean scores on the F-Scale and the E-Scale relative to the other political groups. Rokeach has been reluctant. . .

> to make formal, direct comparisons between Communist and Catholic groups because the former was obtained in England, the latter in America. Nevertheless, it is worth pointing out that a direct comparison of the mean F and E scores for Catholic and Communist groups....reveal marked differences between them.
>
> It is clear that the Catholic and Communist groups diverge sharply from each other with respect to their performance on the California F and E scales. The Catholic group is highest of all the religious groups on both F and E; the Communist group is lowest of all political groups on both F and E.

The interesting, and significant, finding is the relative similarity of Catholics and Communists on the D-Scale. In both comparisons reported (Rokeach, 1956) the Catholics and Communists are highest on the D-Scale compared to the other relevant groups on this measure.

These analyses of the inter-correlarions between the D, F, and E scales, and of the performance of various religious and political groups are highly supportive of the contention that the D-Scale is a measure of authoritarianism which is more free of ethnocentrism and "rightist" or "fascistic" orientations than is the F-Scale.

As a sample of validity information of another type, Rokeach (1960) reports an empirical validity study using the Method of Known Groups. Graduate students were asked to nominate persons whom they thought were relatively closed-minded, dogmatic, or authoritarian and also persons whom they thought to be relatively open-minded, non-dogmatic, or non-authoritarian. The nominees were asked to participate in a research project, were tested with the D-Scale, and the obtained results are in the predicted direction. The high authoritarian nominees had significantly higher D-Scale scores than did the low authoritarian nominees. The two groups of nominees did not differ significantly in either chronological age or measured intelligence. An excellent summary of construct and empirical validation studies can be found in Rokeach's book The Open and Closed Mind.

Various reports of scale reliability for the D-Scale are available. Rokeach (1956) reports odd-even, split-half reliabilities for various forms of the D-Scale to range from .70 to .91. For Form E used with relatively small samples of English college students and with English workers, odd-even reliabilities are .78 and .81 respectively. After our initial testing, random samples of 400 each male and female subjects were studied for scale reliability. The odd-even reliability for males was .84 and for females .85 (Plant, Minium, & Myers, 1959). In the results of this study reported later, stability coefficients for various groups over a two- and a four-year period are reported.

In all, the D-Scale was chosen for inclusion in the battery because of the feeling that this scale was the best measure of general authoritarianism available at the time,[2] and because of the opportunity to make comparisons with similar studies being undertaken at other colleges and universities.

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[2] A committee sponsored by the Social Science Research Council Committee on Personality Development in Youth has undertaken the development of an authoritarianism scale to be used in research on changes in college students. Professor George Stern, Syracuse University, is chairman of the scale development committee, and we have provided data on one of the preliminary forms of the new scale from San Jose State College freshmen. It may be that sometime in the future the new SSRC scale will be a better measure to use in this type of research than the Rokeach D-Scale: Form E.

The subject is instructed to respond to the items in the E, F, and D scales in the same fashion. If the subject strongly agrees with any statement he responds +3, if moderate agreement +2, if slight agreement +1, if slight disagreement -1, moderate disagreement -2, and strong disagreement -3. A transformation of the subject's response is made in scoring the scales by adding a constant of +4 to the subject's plus or minus responses. A summation of all of the transformed item scores is the subject's score for any of the three scales, and these scores are the ones employed in this study. A relatively high score on any of the measures indicates high degree of ethnocentrism, authoritarianism or dogmatism whereas a relatively low score indicates relative freedom from ethnocentrism, authoritarianism, or dogmatism as defined by the three scales.

The A.C.E.: Forms 1949 and 1952

As was indicated, a fourth scale was used with all subjects for the purpose of obtaining control data on scholastic aptitude if these data were needed in the analyses to be reported. The total raw score from either the 1949 or 1952 form of the American Council on Education Psychological Examination for College Freshmen was obtained for each subject. All 1952 A.C.E. total raw scores were converted to 1949 Form total raw score equivalents by using the tables provided for this conversion.

First Administration of the "Opinion Questionnaire": 1958

In the late spring, summer, and early fall of 1958, the "Opinion Questionnaire" was administered to 2,397 persons who were applying for admission to San Jose State College as entering freshmen for the following September semester. The "Opinion Questionnaire" was administered as one part of the Pre-Matriculation Test Battery which is taken by all entering students at the college. The subjects were told that the Pre-Matriculation Test Battery is given for student guidance and placement purposes only, and that ultimate enrollment was not contingent upon Pre-Matriculation Test Battery results. Such is the case at the particular institution in question.

When the "Opinion Questionnaire" was administered, the directions which appear on the booklet were read and questions were permitted to be asked about the instructions if they seemed unclear. The directions also included instructions for filling in the blanks for the subject's name in full, birthdate, and sex.

Of the 2,397 "Opinion Questionnaires" administered, all but 47 were usable for purposes of this study. The 47 which had to be rejected were either incomplete, the subject could not be identified, or had had some formal education beyond a high school education. Of the original usable sample of 2,350, 1,343 were females and 1,007 were males.

Second Administration of the "Opinion Questionnaire": 1960

In April of 1960, a determination of college enrollment status was made for each of the originally tested 2,350 subjects. In May, letters were sent to each of the original subjects asking them to participate in a study of the opinions of college-age persons. Included with the letter was an unused "Opinion Questionnaire" and a stamped return envelope. Two weeks after the mailing, a follow-up postal card was sent to each of the original subjects from whom no response had been obtained in the intervening time period. As a result of these two attempts to solicit participation in the 1960 re-testing, responses were obtained from 1,452 subjects of whom 845 were females and 607 were males.

Third Administration of the "Opinion Questionnaire": 1962

In April 1962, a determination of college enrollment status was made for each of the originally tested 2,350 subjects. In May letters were sent to each of the original subjects asking them to participate in a study of the opinions of college-age persons. Included with the letter was an unused "Opinion Questionnaire" and a stamped return envelope. Two weeks after the mailing, a follow-up postal card was sent to each of the original subjects from whom no response had been obtained in the intervening time period. As a result of these two attempts to solicit participation in the 1962 re-testing, responses were obtained from 1,058 subjects of whom 461 were males and 597 were females.

Groups of Subjects Studied

In view of the fact that we had found statistically significant sex differences in an earlier study with one form of the E-Scale used with San Jose State College freshmen (Plant, 1958b), an analysis of sex differences was made for the variables in the current study. When t tests of the significance of the difference between uncorrelated sample means were conducted for the original sample of males and females, significant differences beyond the .01 level were found for two of the three "Opinion Questionnaire" variables. Table I contains the results of the sex difference analysis.

TABLE 1

Sex Differences in Original Sample E, F, and D Scale Means

	Males Mean	Males Sigma	Males N	Females N	Females Mean	Females Sigma	t	P
E-Scale	87.50	23.11	1,007	1,343	81.70	23.34	5.99	.01
F-Scale	123.40	22.49	1,007	1,343	121.80	23.83	1.68	ns.
D-Scale	159.70	25.34	1,007	1,343	155.32	26.15	4.09	.01

In the light of the females having significantly lower means on the D and E Scales, all of the comparisons in the current study have been made for subjects separated into the appropriate sex group.

For the Two-Year Study (1958 to 1960), subjects were divided into groups differing in amount of college enrollment during the two years. Three groups each of males and females were chosen for study: males enrolled for four semesters, females enrolled for four semesters, males enrolled for one to three semesters, females enrolled for one to three semesters, males enrolled for no semesters, and females enrolled for no semesters. Table 2 contains a distribution of cases by sex and amount of educational experience during the 1958 to 1960 period. Four responses were received in 1960 beyond the arbitrary cut-off date of July 1, and are not included in the summary in table 2.

There are two differences in totals which should be noted. The differences in totals for number possible (N) 1958 in table 1 and in table 2 reflect receipt of the word of a subject's death, incapacitation, or desire of subject or of subject's parents to no longer participate in the study.

TABLE 2

Distribution of Cases by Sex and Amount of Education
During the Period 1958 to 1960

Enrolled 1958-1960 Semesters	N	Non-respond 1960	Responded 1960	Usable Cases
Males				
4	387	105	282	282
1-2-3	431	189	242	148
0	180	99	81	37
Totals	998	393	605	467
Females				
4	552	103	449	449
1-2-3	578	283	295	202
0	204	105	99	59
Totals	1,334	491	843	710

The differences between Respond 1960 and Usable Cases columns in table 2 are due either to insufficient response, an unscorable response, or enrollment in another college or university. Ninety-one of the "1-2-3 Semester" male respondents of 1960 indicated that they were enrolled at some other institution of higher education in spring 1960, as did ninety of the "1-2-3 Semester" female respondents of 1960. Our first thought was to include these transfer students in the "4 Semester" categories, but decided that this might make the analyses of the data less clearly related to the purposes of the study. The same decisions were made regarding the forty-three "0 Semester" males who had enrolled elsewhere and for the forty "0 Semester" females who had enrolled elsewhere too.

The Two-Year Study analyses were made with the data obtained from those subjects categorized in table 2 as Usable Cases.

For the Four-Year Study (1958 to 1962), subjects were divided into groups differing in amount of college educational experience during the four years. Five groups each of males and females were chosen for study: males enrolled for 7 or 8 semesters, females enrolled for 7 or 8 semesters, males enrolled for 5 or 6 semesters, females enrolled for 5 or 6 semesters, males enrolled 3 or 4 semesters, females enrolled 3 or 4 semesters, males enrolled 1 or 2 semesters, females enrolled 1 or 2 semesters, males enrolled for no semesters, and females enrolled for no semesters. Table 3 contains a distribution of cases by sex and amount of educational experience during the 1958 to 1962 period. Nine responses were received in 1962 beyond the arbitrary cut-off date of July 1, and are not included in the summary in table 3.

The differences in totals for number possible (N) 1960 in table 2 and in table 3 reflect the receipt of the word of a subject's death, incapacitation, or desire of subject or of subject's parents to no longer participate in the study.

The differences between Respond 1962 and Usable Cases columns in table 3 are due to enrollment in another college or university, an insufficient response, or a response which was unscorable. Twenty-nine of the male respondents in the various educational attainment groups declared themselves to be enrolled in a college or university elsewhere and were eliminated from the 1958 to 1962 analyses, as were forty-three of the female respondents for the same reason. The Four-Year Study analyses were made with the data obtained from those subjects categorized in table 3 as Usable Cases.

TABLE 3

Distribution of Cases by Sex and Amount of Education
During the Period 1958 to 1962

Enrolled 1958-1962 Semesters	N	Non-respond 1962	Responded 1962	Usable Cases
Males				
7 or 8	301	122	179	172
5 or 6	111	57	54	53
3 or 4	156	88	68	62
1 or 2	279	164	115	105
0	156	111	45	36
Totals	1,003	542	461	428
Females				
7 or 8	329	115	214	212
5 or 6	158	72	86	81
3 or 4	265	144	121	104
1 or 2	400	277	123	106
0	192	139	53	43
Totals	1,344	747	597	546

Restatement of the Hypotheses for the Two-Year Study

In light of the definition of authoritarianism and intolerance now stated in terms of the Ethnocentrism, Authoritarianism, and Dogmatism Scales, and the decision to keep male and female groups separated for analyses, the generally stated hypotheses in the introduction need to be restated.

For the Two-Year Study, the hypotheses stated in null hypothesis terms were:

I . Males enrolled in college for two years do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

Ia. Females enrolled in college for two years do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

II . Males enrolled in college for one to three semesters during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

IIa. Females enrolled in college for one to three semesters during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

III . Males who intended to enroll in college but did not during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

IIIa. Females who intended to enroll in college but did not during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period.

Additional Questions Studied

In addition to the hypotheses stated above, there were select questions of interest investigated. These questions had to do with factors involved in changes in measured ethnocentrism, authoritarianism, or dogmatism. These four questions were:

A. Is aptitude associated with changes in measured ethnocentrism, authoritarianism, or dogmatism?

B. Are there sex differences in changes in measured ethnocentrism, authoritarianism, or dogmatism?

C. Do males who become members of social fraternities and are enrolled for four semesters during the two-year period change in measured ethnocentrism, authoritarianism, or dogmatism?

D. Do females who become members of social sororities and are enrolled for four semesters during the two-year period change in measured ethnocentrism, authoritarianism, or dogmatism?

Restatement of the Hypotheses for the Four-Year Study

For the Four-Year Study, the restated hypotheses were:

I' . Males enrolled in college for 7 or 8 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

I'a. Females enrolled in college for 7 or 8 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

II' . Males enrolled in college for 5 or 6 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

II'a. Females enrolled in college for 5 or 6 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

III' . Males enrolled in college for 3 or 4 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

III'a. Females enrolled in college for 3 or 4 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

IV' . Males enrolled in college for 1 or 2 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

IV'a. Females enrolled in college for 1 or 2 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

V' . Males enrolled in college for no semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

V'a. Females enrolled in college for no semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period.

CHAPTER III

RESULTS AND DISCUSSION: THE TWO-YEAR STUDY

The results will be presented in the order of the restated hypotheses, and in the order of the questions investigated which had to do with factors associated with change.

Hypotheses I and Ia

In order to test hypotheses I and Ia (that males and females enrolled in college for two years do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period), mean 1958 scores on the E, F, and D scales were compared with mean 1960 scores on the E, F, and D scales for 282 males and 449 females enrolled for four semesters over the two-year period. Tests of the significance of the difference for correlated means were used to test these hypotheses. Tables 4 and 5 contain the relevant data for these comparisons.

TABLE 4

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 282 Males Enrolled for Four Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	84.93	21.07	75.85	21.64	.63	8.25	.01
F-Scale	121.93	19.12	104.10	21.62	.55	15.37	.01
D-Scale	157.48	23.95	144.17	25.17	.56	9.46	.01

TABLE 5

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 449 Females Enrolled for Four Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	80.11	22.27	69.29	20.00	.65	12.88	.01
F-Scale	120.69	22.47	101.45	22.95	.60	20.25	.01
D-Scale	153.79	25.11	138.94	24.99	.62	14.42	.01

As can be readily seen in tables 4 and 5, the males and the females enrolled for four semesters during the two-year period change significantly. This change is, without exception, in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypotheses I and Ia are rejected; there is significant change associated with two years of collegiate experience.

Hypotheses II and IIa

To test hypotheses II and IIa (that males and females enrolled in college for one to three semesters during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period), mean 1958 scores on the E, F, and D Scales were compared with mean 1960 scores on the E, F, and D Scales for 148 males and 202 females for one to three semesters over the two-year period. Tests of the significance of the difference for correlated means were used to test hypotheses II and IIa. Tables 6 and 7 contain the relevant data for these comparisons.

The six t-test results reported in tables 6 and 7 are all significant beyond the .01 level of significance. The changes indicated by these significance tests are all in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypotheses II and IIa are rejected; there is change associated with from one to three semesters of college enrollment during the two-year period.

TABLE 6

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 148 Males Enrolled for One to Three Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	86.03	22.86	79.28	23.82	.68	4.38	.01
F-Scale	122.45	18.29	109.43	22.07	.54	8.06	.01
D-Scale	159.99	26.02	145.19	26.44	.63	7.96	.01

TABLE 7

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 202 Females Enrolled for One to Three Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	78.02	23.25	70.68	22.65	.72	6.07	.01
F-Scale	115.60	24.04	104.10	25.04	.62	7.62	.01
D-Scale	149.75	27.49	137.35	26.89	.61	7.34	.01

Hypotheses III and IIIa

To test hypotheses III and IIIa (that males and females who intended to enroll in college but did not during a two-year period do not change in measured ethnocentrism, authoritarianism, or dogmatism over the two-year period), mean 1958 scores on the E, F, and D Scales were compared with mean 1960 scores on the E, F, and D Scales for 37 males and 59 females who apparently intended to enroll in college but did not during the two-year period. Tests of the significance of the difference for correlated means were used to test hypotheses III and IIIa. Tables 8 and 9 contain the relevant data for these comparisons.

TABLE 8

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 37 Males Enrolled for No Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	92.27	24.13	87.70	26.27	.62	1.57	ns.
F-Scale	131.65	23.34	121.27	25.88	.73	3.41	.01
D-Scale	167.03	29.90	156.16	30.04	.63	2.53	.05

The results of the tests of significance between 1958 and 1960 means reported in tables 8 and 9 provide the first comparisons for the two-year study which do not reach the .01 level of significance. It will be noted that in table 9 all comparisons reach the .05 level of significance or better, and therefore that females not enrolled in college during the two-year period change significantly in ethnocentrism, authoritarianism, and dogmatism. The change in each of the three variables is in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypothesis IIIa is rejected; there is significant change associated with no college enrollment for females during the two-year period of time.

TABLE 9

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 59 Females Enrolled for No Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	84.17	20.36	78.90	22.62	.61	2.10	.05
F-Scale	127.61	21.67	116.98	25.35	.59	3.76	.01
D-Scale	160.78	22.00	149.75	26.29	.44	3.25	.01

In table 8, it will be noted, the 1958 and 1960 E-Scale comparison for non-enrolled males yields a difference which is not statistically significant. The other two comparisons for non-enrolled males do reach acceptable levels of significance, and in both cases the differences are in the direction of decreased authoritarianism and dogmatism. In the most strict interpretation of the results reported in table 8, we should partially reject hypothesis III. We have decided, though, that in view of the fact that the E-Scale comparison for non-enrolled males yields a difference between means which is in the same direction as the two comparisons which are significant, to reject hypothesis III. As was the case with non-enrolled females, there is change in non-enrolled males' toward decreased ethnocentrism, authoritarianism, and dogmatism although the decrease in ethnocentrism is not statistically significant.

The results for hypotheses I and Ia were in the expected direction, and agree with the results of an earlier local study on a similar problem (Plant, 1958a), and with the results for the Vassar study ([illegible] 1956, 1958). The results for hypotheses I and Ia are in par[illegible]t with the results obtained at the University of Santa Cla[illegible] et. al., 1961). It will be remembered that significant dec[illegible] in mean F-Scale scores were obtained at Santa Clara over the period of one academic year with freshmen, but that mean E-Scale scores did not change significantly over the same period. For both males and females at San Jose State College, mean F-Scale and E-Scale scores were significantly lower over a two-year academic period of enrollment.

The results obtained for hypotheses II, IIa, III, and IIIa are in conflict with the results obtained earlier at the same institution. Over the two-year period 1953 to 1955, we found that subjects enrolled for the two years changed significantly in the direction of decreased ethnocentrism, but that subjects enrolled for "some" college or not at all during the two-year period did not change significantly. It should be noted here that, for the 1953 to 1955 study groups of "some college" subjects, changes in measured ethnocentrism were in the direction of decreased ethnocentrism.

It is not possible to compare our results for "some college" and "non-college" comparison groups with the results obtained by another investigator because we know of no other research in which an attempt has been made to obtain comparison or control groups.

In light of the fact that we have reported eighteen 1958 to 1960 comparisons of authoritarian and intolerance variables for groups of males and of females differing in amount of higher education during a two-year period, that seventeen of these comparisons reach acceptable levels of statistical significance, that all eighteen comparisons yield results in the same direction of change over the two-year period, we have tentatively called the notion of college impact or effect into question. Perhaps a better statement at this time would be that we have found evidence which necessitates a new interpretation of research results relating to certain non-intellectual changes in students associated with increments of higher education. Tentatively, it seems that the collegiate experience has a facilitation effect upon certain non-intellectual changes which are underway in young adults who aspire to college.

One of the most important reasons for making this interpretation tentative has to do with the nature of psychological tests, and the lack of an exact solution of the problem of comparing groups on amounts of change. The results of the two-year study are clear; subjects change. They become less authoritarian and intolerant over the two-year period irrespective of their amount of collegiate experience. They differ, when grouped by educational experience during a two-year period, in initial mean scores and in terminal mean scores and this is where the measurement problem enters into the interpretation. The E, F, and D Scales are presumed to be ordinal scales (as are most, if not all, psychological scales) which means that they have no absolute zero point and that the units of measurement are unequal. We do not know if the difference between means of from 100 to 80 over a two-year period is the same as a difference between means of from 80 to 60 over the two-year period when the same ordinal scale is used with two groups with these resulting means. All that one can say is that both groups change on the scale variable over the two-year period, and that the initial and terminal mean scores are different for the two groups. This is why a direct comparison between groups at the same college or between groups at different colleges who differ in initial mean scale status can be made only tentatively. In discussing the use of mental tests for studying changes in students, Webster, et. al. (1962, p. 815) state. . ."An exact solution to the problem of comparing individuals or groups on amounts of change will probably have to await the development of new kinds of scales." Our groups do change, and in the same direction. There is a general tendency for groups with the highest number of semesters enrollment during the two years to have the lowest mean scores on the E, F, and D Scales both in 1958 and in 1960. There is also a general tendency for the net change in mean 1958 to mean 1960 E, F, and D Scale scores to be greatest for those with the highest number of semesters enrollment during the two years and lowest for those with the fewest number of semesters of enrollment. These observations have led us to the interpretation of the current results in terms of a facilitation effect of collegiate experience upon non-intellectual changes which appear to be underway in college aspiring youth.

It may well be that persons who participate in a study like the current one are more likely to change in the study variables over time irrespective of educational experience than will those who elect not to participate. There is no direct test of this proposition because of the obvious lack of 1960 data for the non-respondents. Some opportunity does exist to study whether or not 1960 respondents were different from 1960 non-respondents in terms of 1958 scale performance, and such comparisons have been made. If the respondents of 1960 were radically different from the non-respondents of 1960 in terms of 1958 status on the study scales, then the generalizations from the current study would need to be limited to changes in authoritarianism and intolerance of those who for whatever reason choose to participate in this longitudinal study. Tables 10 and 11 contain the relevant data for all male respondents and all female respondents of 1960 compared with all male and female non-respondents of 1960 distributed by number of semesters enrolled during a two-year period. Note in the "1-2-3 semesters" totals and the "0 semesters" totals in tables 10 and 11 that all respondents are included even though some subjects in each category were enrolled at another college or university at the time of responding in 1960. The decision to include these respondents of 1960 was made in light of the probable inclusion of subjects in the non-respondent categories who have transferred to other institutions and our not knowing this.

From table 10 it will be observed that none of the comparisons of 1958 status of male respondents compared with male non-respondents of 1960 is significant. There does not even seem to be a pattern of mean differences. With respect to the male subjects in the Two-Year Study, the differences between those who chose to participate in this longitudinal study compared on initial scale performance with those who chose not participate are not significant.

Generalizations from the current study are not restricted by initial differences between males who responded and those who did not in 1960.

TABLE 10

1958 E-Scale, F-Scale, and D-Scale Means of all Male 1960 Respondents Compared with All Male 1960 Non-Respondents

	Respond 1960			Non-Respond 1960					
Semesters	N	Mean	Sigma	N	Mean	Sigma	Mr-Mnr*	t	P
E Scale									
4	282	84.93	21.07	105	87.86	23.29	-2.93	1.12	ns.
1-2-3	242	87.64	22.64	189	88.57	23.06	- .93	.42	ns.
0	81	90.67	23.52	99	91.67	25.93	-1.00	.27	ns.
F-Scale									
4	282	121.93	19.12	105	121.50	23.17	+ .43	.17	ns.
1-2-3	242	124.06	21.22	189	123.59	22.92	+ .47	.22	ns.
0	81	128.56	21.33	99	125.39	24.71	+3.17	.92	ns.
D-Scale									
4	282	157.48	23.95	105	159.12	24.59	-1.64	.58	ns.
1-2-3	242	160.70	26.71	189	158.91	25.77	+1.79	.70	ns.
0	81	163.98	26.70	99	162.83	27.89	+1.15	.28	ns.

* Mr-Mnr = Mean of respondents minus mean of non-respondents

The female respondent vs. non-respondent comparisons in table 11 yield two differences in 1958 scale means which are significant, and there is a similarity of direction of mean differences for all comparisons. The two significant differences reported in table 11 are both for the groups enrolled "1-2-3 semesters", and indicate that females in this educational experience category who responded in 1960 were significantly lower on the E-Scale and F-Scale in 1958 than were those who did not respond in 1960. These differences probably restrict the generalizations from the current study, at least for the female comparison group. The differences for the enrolled "4 semesters" and the "0 semesters" groups are not significant, and in light of our view that these are the two key groups for study, the generalizations of this study are not restricted by initial differences between respondents vs. non-respondents.

TABLE 11

1958 E-Scale, F-Scale, and D-Scale Means of all Female 1960 Respondents Compared with All Female 1960 Non-Respondents

	Respond 1960			Non-Respond 1960					
Semesters	N	Mean	Sigma	N	Mean	Sigma	Mr-Mnr*	t	P
E-Scale									
4	449	80.11	22.27	103	81.67	22.75	-1.56	.63	ns.
1-2-3	295	79.50	23.25	283	83.76	22.65	-4.26	2.22	.05
0	99	84.62	20.36	105	86.89	24.52	-2.27	.72	ns.
F-Scale									
4	449	120.69	22.47	103	121.87	21.30	-1.18	.50	ns.
1-2-3	295	118.95	25.26	283	124.17	22.95	-5.22	2.60	.01
0	99	125.73	23.54	105	127.55	17.81	-1.82	.62	ns.
D-Scale									
4	449	153.79	25.11	103	156.92	25.50	-3.13	1.12	ns.
1-2-3	295	152.71	28.27	283	156.24	26.72	-3.53	1.54	ns.
0	99	158.44	23.42	105	161.53	23.16	-3.09	.94	ns.

* Mr-Mnr = Mean of respondents minus Mean of non-respondents

Questions Investigated in Addition to the Hypotheses

As was indicated earlier in the procedures section, in addition to the Two-Year Study hypotheses, select questions were investigated using the two-year data.

Question A

Is aptitude associated with changes in measured ethnocentrism, authoritarianism, or dogmatism?

It was anticipated that there would be changes in the study variables over the two-year period for those who were enrolled for four semesters during the two-year period. Such was the case for all groups, not just the enrolled four-semester groups. Some interest centered on the question of whether or not the most academically able would be the ones to change most or least, and an attempt to investigate this question was undertaken. A.C.E. Total raw scores were obtained for all subjects at the time of initial testing, and these scores were correlated with what we have called 1958 to 1960 "Shift-scores". All Shift-scores were derived by subtracting the 1960 E, F, or D Scale score from the 1958 E, F, or D Scale score, and then adding 100 to the remainder. A Shift-score above 100 indicates a decrease in the score over the two years, and a Shift-score below 100 indicates an increase in scale score over the two-year period. It must be noted that Shift-scores are, in effect, net difference scores without regard to where in the scale the difference occurred. A Shift-score of 110 on the E-Scale would mean a decrease in ethnocentrism over the two-year period whether it was from a 1958 to 1960 E-Scale score difference of from 240 to 230 or from 100 to 90. The nature of the measurement problem makes our correlational analysis of A.C.E. Total raw scores and Shift-scores suggestive only. Table 12 contains the correlation coefficients for the A.C.E. and Shift-scores for males and females categorized by educational enrollment during a two-year period.

TABLE 12

Correlations Between A.C.E. Total Raw Score and E-Scale Shift-scores, F-Scale Shift-scores, and D-Scale Shift-scores for Males and Females Distributed by Amount of Education 1958 to 1960

	Semesters	N	r ACE: E-Scale Shift-score	r ACE: F-Scale Shift-score	r ACE: D-Scale Shift-score
Males					
	4	282	-.01	-.02	-.12
	1-2-3	148	-.18	-.09	-.13
	0	37	+.22	.00	+.04
Females					
	4	449	-.06	-.02	-.05
	1-2-3	202	-.12	-.14	-.11
	0	59	-.05	-.20	-.07

The eighteen correlation coefficients reported in table 12 are all relatively low with only two significantly different from zero. These correlation coefficients are similar to those obtained for A.C.E. and E-Scale Shift-scores in our 1953 to 1955 study (Plant, 1958b), and once again indicate that amount of shift in E-Scale scores over a two-year period is not significantly correlated with aptitude as measured by the widely used A.C.E. test. The same is true generally for the amount of shift in 1958 to 1960 F-Scale and D-scale scores. It appears that amount of shift in E-Scale, F-Scale, or D-Scale scores over a two-year period is not significantly related to scholastic aptitude.

Question B

Are there sex differences in changes in measured ethnocentrism, authoritarianism, or dogmatism for those who are enrolled four semesters during the two-year period?

Because most of the research on personality changes and higher education has been accomplished in colleges and universities in which there are only male students or only female students, some interest exists in studies on changes in males and females from the same institution.

We found that when all of our male subjects were compared with all of our female subjects in 1958 (see page 28, this report) that females had significantly lower E-Scale and D-Scale means than did males. The question to which we address ourselves here is whether or not these same differences existed in 1958 for males and females who enrolled in college and completed four semesters during the two-year period, and whether or not the differences existed in 1960 for these groups. Table 13 contains the relevant data for these comparisons of males and females as of 1958 and as of 1960.

TABLE 13

Sex Differences in 1958 & 1960 E-Scale, F-Scale, and D-Scale Means for 282 Males & 449 Females Enrolled Four Semesters from 1958 to 1960

	Males		Females			
	Mean 1958	Sigma 1958	Mean 1958	Sigma 1958	t	P
E-Scale	84.93	21.07	80.11	22.27	2.94	.01
F-Scale	121.93	19.12	120.69	22.47	.68	ns.
D-Scale	157.48	23.95	153.79	25.11	1.98	.05
	Mean 1960	Sigma 1960	Mean 1960	Sigma 1960	t	P
E-Scale	75.85	21.64	69.29	20.00	4.10	.01
F-Scale	104.10	21.62	101.45	22.95	1.52	ns.
D-Scale	144.17	25.17	138.94	24.99	2.74	.01

As was the case in the all male vs. all female comparisons, females who were enrolled for four semesters had significantly lower E-Scale and D-Scale means in 1958 and in 1960 than did males who were enrolled for four semesters 1958 to 1960. It must be remembered that both males and females changed significantly over the two-year period, but that females were significantly different from males both at the beginning of the two-year period and at the end of the two-year period on the E-Scale and the D-Scale. Although the data are only suggestive, the mean Shift-scores for females enrolled for four semesters are higher than the mean Shift-scores for males enrolled for four semesters. This indicates that the net amount of change was slightly greater for the females than for the males, but as the illustrative data in table 14 indicate, the differences are minimal.

TABLE 14

Mean 1958 - 1960 E-Scale Shift-scores, F-Scale Shift-scores, and D-Scale Shift-scores for 282 Males and 449 Females Enrolled for Four Semesters 1958 to 1960

	Males M 58-60 Shift-Score	Females M 58-60 Shift-Score
E-Scale	108.99	110.82
F-Scale	117.83	119.24
D-Scale	113.31	114.85

Our results for the two-year period indicate that males and females enrolled for four semesters become less ethnocentric, authoritarian, and dogmatic over the two-year period. Females are less ethnocentric and dogmatic at the beginning of the two-year period and at the end of the two-year period than are males, and it is suggested that net changes for females are greater than for males although the differences are small.

Question C

Do males who become members of social fraternities and are enrolled for four semesters during the two-year period change in measured ethnocentrism, authoritarianism, or dogmatism?

It is widely known that social fraternity groups often select their members in part in terms of non-membership (or membership) in certain racial, ethnic, or religious groups. It is also said that fraternity men often are anti-intellectual, and that the objectives of a college are in direct conflict with those of social fraternities. We have been interested in determining whether or not fraternity men change in ethnocentrism, authoritarianism, or dogmatism during a two-year period of enrollment in college, and have data related to this question.

It was determined that responses in 1960 were obtained from 49 males who had become members of social fraternities, and who had been enrolled for four semesters 1958 to 1960. An analysis of the E, F, and D Scale scores for these fraternity men was undertaken, and the results are reported in table 15.

Two of the three comparisons for fraternity males over the two-year period were significant beyond the .01 level of significance. All three mean differences over the two-year period are in the same direction. We take these results to indicate that males who become fraternity members and are enrolled for four semesters during the two-year period of this study become less ethnocentric, authoritarian, and dogmatic over the two-year period.

TABLE 15

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 49 Social Fraternity Males Enrolled for Four Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	85.32	21.83	78.63	25.05	.35	1.73	ns.
F-Scale	117.49	20.08	98.30	21.72	.52	6.48	.01
D-Scale	153.53	19.77	136.10	24.72	.32	4.60	.01

Question D

Do females who become members of social sororities and are enrolled for four semesters during the two-year period change in measured ethnocentrism, authoritarianism, or dogmatism?

The same types of observations which have been made about social fraternities have also been made about social sororities, and we have been interested in determining whether or not there are changes in sorority members over the two-year period.

Responses in 1960 were obtained from 124 females who had become members of social sororities, and who had been enrolled for four semesters 1958 to 1960. An analysis of the E, F, and D Scale scores for these 124 sorority members was undertaken, and the results are reported in table 16.

All three of the comparisons for sorority females reported in table 16 were significant beyond the .01 level of significance. All three mean differences over the two-year period were in the same direction. We take these results to indicate that females who become members of social sororities and are enrolled for four semesters during the two-year period of this study become less ethnocentric, authoritarian, and dogmatic over the two-year period.

TABLE 16

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1960 for 124 Social Sorority Females Enrolled for Four Semesters 1958 to 1960

	Mean 1958	Sigma 1958	Mean 1960	Sigma 1960	r 1958-1960	t	P
E-Scale	83.44	22.26	73.60	21.72	.63	5.75	.01
F-Scale	121.99	22.38	101.59	19.49	.59	11.79	.01
D-Scale	155.07	23.38	137.53	25.32	.67	9.80	.01

CHAPTER IV

RESULTS AND DISCUSSION: THE FOUR-YEAR STUDY

The results for The Four-Year Study will be presented in order of the restated hypotheses found in the procedures chapter.

Hypotheses I' and I'a

In order to test hypotheses I' and I'a (that males and females enrolled in college for 7 or 8 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period), mean 1958 scores on the E, F, and D scales were compared with mean 1962 scores on the same scales for 172 males and 212 females enrolled for 7 or 8 semesters over the four-year period. Tests of the significance of the difference for correlated means were used to test these hypotheses. Table 17 contains the relevant data for both the male and female comparisons over the four-year period.

As can be readily seen in table 17, the males and the females enrolled for 7 or 8 semesters during the four-year period change significantly. This change is, without exception, in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypotheses I' and I'a have been rejected; there is significant change associated with 7 or 8 semesters of collegiate experience.

Hypotheses II' and II'a

To test hypotheses II' and II'a (that males and females enrolled in college for 5 or 6 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period), mean 1958 scores on the E, F, and D Scales were compared with mean 1962 scores on the same scales for 53 males and 81 females enrolled for 5 or 6 semesters

TABLE 17

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1962 for 172 Males and 212 Females Enrolled for 7 or 8 Semesters 1958 to 1962

	Mean 1958	Sigma 1958	Mean 1962	Sigma 1962	r 1958-1962	t	P
Males							
E-Scale	84.32	21.96	70.37	22.48	.47	7.97	.01
F-Scale	123.55	20.96	101.13	25.04	.60	14.10	.01
D-Scale	159.74	24.86	139.85	27.38	.56	10.58	.01
Females							
E-Scale	79.72	22.11	63.52	18.55	.53	11.83	.01
F-Scale	121.15	24.10	94.78	24.33	.80	24.87	.01
D-Scale	154.01	27.16	133.96	26.71	.59	12.17	.01

over the four-year period. Tests of the significance of the difference for correlated means were used to test hypotheses II' and II'a. Table 18 contains the relevant data for both the male and female comparisons over the four-year period.

The six t-test results reported in table 18 are all significant beyond the .01 level of significance. The changes indicated by these significance tests are all in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypotheses II' and II'a are rejected; there is change associated with 5 or 6 semesters of college enrollment during the four-year period.

Hypotheses III' and III'a

To test hypotheses III' and III'a (that males and females enrolled in college for 3 or 4 semesters of a four-year period do

TABLE 18

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1962 for 53 Males and 81 Females Enrolled for 5 or 6 Semesters 1958 to 1962

	Mean 1958	Sigma 1958	Mean 1962	Sigma 1962	r 1958-1962	t	P
Males							
E-Scale	87.17	22.24	71.91	24.02	.77	6.97	.01
F-Scale	116.66	17.50	96.38	21.72	.65	8.62	.01
D-Scale	151.43	21.14	140.64	22.94	.62	4.04	.01
Females							
E-Scale	77.75	21.72	68.06	26.42	.71	4.61	.01
F-Scale	120.33	21.37	99.80	25.53	.69	9.73	.01
D-Scale	153.06	22.05	135.80	25.72	.63	7.49	.01

not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period), mean 1958 scores on the E, F, and D Scales were compared with mean 1962 scores on the E, F, and D Scales for 62 males and 104 females enrolled for 3 or 4 semesters over the four-year period. Tests of the significance of the difference for correlated means were used to test hypotheses III' and III'a. Table 19 contains the relevant data for both the male and female comparisons over the four-year period.

As will be noted in table 19, the males and the females enrolled for 3 or 4 semesters during the four-year period change significantly in the study variables. This change is, without exception, in the direction of decrease in ethnocentrism, authoritarianism, and dogmatism as measured by the three scales.

TABLE 19

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1962 for 62 Males and 104 Females Enrolled for 3 or 4 Semesters 1958 to 1962

	Mean 1958	Sigma 1958	Mean 1962	Sigma 1962	r 1958-1962	t	P
Males							
E-Scale	88.00	22.14	80.93	20.99	.65	3.04	.01
F-Scale	123.42	20.66	108.63	22.69	.51	5.38	.01
D-Scale	158.68	23.00	146.48	21.78	.44	4.02	.01
Females							
E-Scale	78.37	22.92	67.78	22.42	.73	6.42	.01
F-Scale	118.62	25.56	99.75	26.27	.59	8.17	.01
D-Scale	151.82	23.52	135.39	23.15	.79	8.13	.01

Hypotheses III' and III'a have been rejected; there is significant change associated with 3 or 4 semesters of collegiate experience over the four-year period.

Hypotheses IV' and IV'a

To test hypotheses IV' and IV'a (that males and females enrolled in college for 1 or 2 semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period), mean 1958 scores on the E, F, and D Scales were compared with 1962 mean scores on the same scales for 105 males and 106 females enrolled for 1 or 2 semesters over the four-year period. Tests of the significance of the difference for correlated means were used to test hypotheses IV' and IV'a. Table 20 contains the relevant data for both the male and female comparisons over the four-year period.

TABLE 20

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1962 for 105 Males and 106 Females Enrolled for 1 or 2 Semesters 1958 to 1962

	Mean 1958	Sigma 1958	Mean 1962	Sigma 1962	r 1958-1962	t	P
Males							
E-Scale	88.54	21.71	78.09	23.96	.53	4.90	.01
F-Scale	124.57	22.65	107.43	24.36	.60	8.28	.01
D-Scale	160.79	23.81	144.30	25.04	.39	6.24	.01
Females							
E-Scale	80.71	21.79	72.65	20.52	.63	4.53	.01
F-Scale	122.59	25.03	108.73	25.08	.67	7.00	.01
D-Scale	156.30	27.74	142.83	26.07	.55	5.41	.01

The six t-test results reported in table 20 are all significant beyond the .01 level of significance. The changes indicated by these significance tests are all in the direction of decreased ethnocentrism, authoritarianism, and dogmatism. Hypotheses IV' and IV'a have been rejected; there is significant change associated with 1 or 2 semesters of college enrollment during the four-year period.

Hypotheses V' and V'a

In order to test hypotheses V' and V'a (that males and females enrolled in college for no semesters of a four-year period do not change significantly in measured ethnocentrism, authoritarianism, or dogmatism over the four-year period), mean 1958 scores on the E, F, and D Scales were compared with 1962 mean scores on the same scales for 36 males and 43 females enrolled for no semesters over the four-year period of this study. Tests of the significance of the difference for correlated means were used to test hypotheses V' and V'a. Table 21 contains the relevant data for both male and female comparisons over the four-year period.

TABLE 21

Differences in E-Scale, F-Scale, and D-Scale Means 1958 - 1962 for 36 Males and 43 Females Enrolled for No Semesters 1958 to 1962

	Mean 1958	Sigma 1958	Mean 1962	Sigma 1962	r 1958-1962	t	P
Males							
E-Scale	95.42	24.10	79.22	25.57	.22	3.09	.01
F-Scale	129.17	21.90	105.94	24.64	.48	5.76	.01
D-Scale	164.58	25.52	146.06	26.48	.58	4.60	.01
Females							
E-Scale	82.67	21.29	75.46	25.45	.62	2.25	.05
F-Scale	126.70	19.89	110.02	26.96	.48	4.39	.01
D-Scale	164.93	17.98	145.09	23.33	.33	5.29	.01

The six t-test results reported in table 21 all reach acceptable levels of significance: five are beyond the .01 level of significance and the sixth is beyond the .05 level of significance.

The changes indicated by these significance tests are all in the direction of decrease in ethnocentrism, authoritarianism, and dogmatism. Hypotheses V' and V'a have been rejected; there is significant change associated with no semesters of college enrollment during the four-year period.

The results obtained for hypotheses I' and I'a were in the expected direction, and agree with the results of an earlier study in which the E-Scale only was used (Plant, 1958c) and with the results of the Vassar research (Webster, 1956, 1958).

The results obtained for hypotheses II', II'a, III', III'a, IV', IV'a, V', and V'a stand at the present as the only results obtained for subjects with different amounts of higher education over a four-year period. As such, there is no basis for comparison of these results with those of another investigator.

In light of the fact that we have reported thirty 1958 to 1962 comparisons of authoritarian and intolerance variables for groups of males and females differing in amount of higher education during the four-year period, that all thirty of these comparisons reach acceptable levels of statistical significance, that all thirty comparisons yield results in the same direction of change over the four-year period, we have called the assertion of college impact on authoritarianism and intolerance into question. What does seem to be a defensible assertion is that the collegiate experience has a facilitation effect upon authoritarianism and intolerance reduction, a change which seems to be underway in young adults who aspire to college irrespective of whether or not they go to college.

As was indicated in the discussion of the Two-Year Study, it is possible that persons who participate in a study like the current one are more likely to change in the study variables over the four-year period irrespective of educational attainment than are those who choose not to participate. We cannot test this possibility directly because of the obvious lack of 1962 responses from the non-respondents. The question can be asked and answered as to whether or not 1962 respondents were different in 1958 from 1962 non-respondents. If large differences exist, generalizations from the current study would be restricted.

Initial status on the E, F, and D Scales was determined for the 1962 male respondents, 1962 male non-respondents, 1962 female respondents, and the 1962 female non-respondents. Comparisons of these 1958 mean scores were made for 1962 respondents vs. non-respondents categorized by number of semesters enrolled during the four-year period. Table 22 contains the comparisons for male subjects, and table 23 contains the comparisons for female subjects.

It will be noted in tables 22 and 23 that none of the comparisons is significant for groups differing in educational attainment during the four-year period who responded in 1962 and who did not respond in 1962. The 1962 respondents were not significantly different from the 1962 non-respondents in terms of 1958 E, F, or D Scale means. The generalizations of this study are not restricted by initial differences between respondents and non-respondents.

TABLE 22

1958 E-Scale, F-Scale, and D-Scale Means of All Usable Male 1962 Respondents Compared with All Male 1962 Non-Respondents

	Respond 1962			Non-Respond 1962					
Semesters	N	Mean	Sigma	N	Mean	Sigma	Mr-Mnr*	t	P
E-Scale									
7 or 8	172	84.32	21.96	122	84.86	21.68	-.54	.23	ns.
5 or 6	53	87.17	22.24	57	88.26	20.79	-1.09	.26	ns.
3 or 4	62	88.00	22.14	88	87.78	23.66	.22	.06	ns.
1 or 2	105	88.54	21.71	164	88.02	23.57	.52	.18	ns.
0	36	95.42	24.10	111	91.78	25.55	3.64	.77	ns.
F-Scale									
7 or 8	172	123.55	20.96	122	121.80	22.98	1.75	.66	ns.
5 or 6	53	116.66	17.50	57	121.82	18.39	-5.16	1.50	ns.
3 or 4	62	123.42	20.66	88	121.57	22.81	1.85	.52	ns.
1 or 2	105	124.57	22.65	164	124.82	24.24	.25	.09	ns.
0	36	129.17	21.90	111	127.39	23.97	1.78	.41	ns.
D-Scale									
7 or 8	172	159.74	24.86	122	159.60	24.05	-.14	.05	ns.
5 or 6	53	151.43	21.14	57	154.81	22.39	-3.38	.81	ns.
3 or 4	62	158.68	23.00	88	160.08	25.67	-1.40	.35	ns.
1 or 2	105	160.79	23.81	164	160.50	28.11	.29	.09	ns.
0	36	164.58	25.52	111	164.71	28.67	.13	.03	ns.

* Mr - Mnr = Mean of Respondents minus Mean of Non-Respondents

TABLE 23

1958 E-Scale, F-Scale, and D-Scale Means of All Usable Female 1962 Respondents Compared with All Female 1962 Non-Respondents

	Respond 1962			Non-Respond 1962					
Semesters	N	Mean	Sigma	N	Mean	Sigma	Mr-Mnr*	t	P
E-Scale									
7 or 8	212	79.72	22.11	115	83.56	21.85	-3.84	1.51	ns.
5 or 6	81	77.75	21.72	72	79.12	21.51	-1.37	.39	ns.
3 or 4	104	78.37	22.92	144	78.63	24.56	-.26	.08	ns.
1 or 2	106	80.71	21.79	277	83.99	23.45	-3.28	1.29	ns.
0	43	82.67	21.29	139	86.82	25.26	-4.15	1.07	ns.
F-Scale									
7 or 8	212	121.15	24.10	115	121.29	20.52	-.14	.06	ns.
5 or 6	81	120.33	21.37	72	119.86	23.33	.47	.13	ns.
3 or 4	104	118.62	25.56	144	117.87	26.68	.75	.22	ns.
1 or 2	106	122.59	25.03	277	123.83	23.63	-1.24	.44	ns.
0	43	126.70	19.89	139	126.73	22.31	-.03	.00	ns.
D-Scale									
7 or 8	212	154.01	27.16	115	155.15	24.54	-.14	.05	ns.
5 or 6	81	153.06	22.05	72	155.17	23.56	-2.11	.57	ns.
3 or 4	104	151.82	23.52	144	150.82	29.54	1.00	.30	ns.
1 or 2	106	156.30	27.74	277	156.11	26.55	.19	.06	ns.
0	43	164.93	17.98	139	158.50	24.16	6.43	1.86	ns.

* Mr - Mnr = Mean of Respondents minus Mean of Non-Respondents

1958 to 1960 and 1960 to 1962 Comparisons

Some interest centers around the question of whether or not there is greater change in personality characteristics associated with the first two or last two years of a college education. We have some information on this question with regard to authoritarianism and intolerance changes for groups differing in educational attainment during a four-year period, not just for those who complete four years of college. Again, reference must be made to the measurement problem discussed earlier when the comparisons for the periods 1958 to 1960 and 1960 to 1962 are made.

Not all of the data for the Two-Year Study or the Four-Year Study can be used for the 1958 to 1960 and 1960 to 1962 comparisons. Eighty of the 428 male 1962 usable subjects did not respond in 1960 thus leaving 348 male cases for whom we have 1958, 1960, and 1962 results. Seventy-three of the 546 female 1962 usable subjects did not respond in 1960 thus leaving 473 female cases for whom we have 1958, 1960, and 1962 results. Comparisons of the two, two-year periods have been made for these 348 males and 473 females categorized by educational attainment during the four-year period. The relevant data are summarized in tables 24, 25, and 26, one summary table for each of the three study scales.

A number of general observations can be made from the results reported in tables 24, 25, and 26. Generally speaking, it seems as if the greatest change in authoritarianism and intolerance occurred with all groups of subjects from 1958 to 1960. Of the thirty 1958 to 1960 comparisons reported in the three tables, 29 reach acceptable levels of significance and all thirty are in the same direction.

TABLE 24

1958, 1960, and 1962 E-Scale Means for 348 Males and 473 Females Categorized by Semesters of Enrollment 1958 to 1962

Semes-ters	N	a:Mean 1958	b:Mean 1960	c:Mean 1962	r a:b	r b:c	t * a:b	t * b:c
Males								
7 or 8	154	84.69	76.31	70.16	.66	.66	6.16[a]	4.40[a]
5 or 6	40	88.97	82.20	73.70	.76	.77	2.46[b]	3.72[a]
3 or 4	47	85.49	79.45	78.60	.71	.78	2.47[b]	.40
1 or 2	80	89.66	82.32	78.94	.66	.68	3.61[a]	1.71
0	27	94.79	84.30	79.56	.57	.86	2.22[b]	1.65
Females								
7 or 8	194	79.47	68.51	63.00	.61	.69	8.36[a]	5.25[a]
5 or 6	76	78.13	67.60	68.41	.78	.75	5.96[a]	-.34
3 or 4	90	78.94	69.12	68.03	.75	.74	5.65[a]	.73
1 or 2	80	80.47	74.97	72.61	.61	.71	2.64[a]	1.31
0	33	81.54	80.51	73.73	.62	.89	.27	3.08[a]

*t a:b and t b:c columns: "a" following t value = P beyond the .01 level of significance, "b" following t value = P beyond the .05 level of significance.

TABLE 25

1958, 1960, and 1962 F-Scale Means for 348 Males and 473 Females Categorized by Semesters of Enrollment 1958 to 1962

Semesters	N	a:Mean 1958	b:Mean 1960	c:Mean 1962	r a:b	r b:c	t * a:b	t * b:c
Males								
7 or 8	154	124.01	105.40	100.90	.62	.68	11.91^a	3.13^a
5 or 6	40	118.75	103.20	99.00	.55	.62	5.51^a	1.50
3 or 4	47	122.34	110.43	109.21	.66	.79	4.44^a	.56
1 or 2	80	126.65	114.91	109.05	.61	.54	5.67^a	2.42^b
0	27	130.33	113.26	107.18	.63	.73	4.19^a	1.60
Females								
7 or 8	194	120.04	101.29	94.60	.62	.71	12.50^a	5.06^a
5 or 6	76	120.85	100.95	99.85	.63	.72	8.85^a	.51
3 or 4	90	118.24	101.83	99.11	.69	.81	7.70^a	1.56
1 or 2	80	121.75	110.67	106.89	.67	.80	4.67^a	2.05^b
0	33	124.30	112.51	107.00	.55	.80	3.10^a	1.93

* t a:b and t b:c columns: "a" following t value = P beyond the .01 level of significance, "b" following t value = P beyond the .05 level of significance.

TABLE 26

1958, 1960, and 1962 D-Scale Means for 348 Males and 473 Females Categorized by Semesters of Enrollment 1958 to 1962

Semesters	N	a:Mean 1958	b:Mean 1960	c:Mean 1962	r a:b	r b:c	t a:b	t b:c
Males								
7 or 8	154	160.39	144.87	140.14	.64	.69	8.83[a]	3.85[a]
5 or 6	40	154.02	147.25	142.97	.63	.66	2.16[b]	1.61
3 or 4	47	156.77	149.11	146.87	.48	.71	2.47[b]	.84
1 or 2	80	161.94	150.19	144.80	.57	.62	4.92[a]	2.46[b]
0	27	164.68	147.44	142.59	.63	.78	3.54[a]	1.27
Females								
7 or 8	194	153.64	138.25	133.36	.64	.69	9.68[a]	3.29[a]
5 or 6	76	153.13	140.95	136.16	.61	.74	5.12[a]	2.28[b]
3 or 4	90	151.03	137.07	134.42	.64	.74	5.45[a]	1.12
1 or 2	80	155.42	142.76	141.22	.57	.67	5.25[a]	.62
0	33	161.88	149.36	141.97	.35	.75	2.90[a]	2.51[b]

* t a:b and t b:c columns: "a" following t value = P beyond the .01 level of significance, "b" following t value = P beyond the .05 level of significance.

Of the thirty 1960 to 1962 comparisons reported in the three tables, thirteen reach acceptable levels of statistical significance and twenty-nine of the thirty are in the same direction. It is probably the case that greater change occurred in the first two years of this study than in the last two years although change continued during the last two years. If the study scales were interval or ratio scales, we could then be more positive about the net changes 1958 to 1960 and 1960 to 1962 and answer the question as to which period reveals the greatest change. As it is, we will need be content to suggest that the change is probably greater for the first two years of this study than for the last two years.

The most impressive observation for the data in tables 24, 25, and 26 is the direction of the differences in means. There are thirty 1958 to 1960 comparisons and thirty 1960 to 1962 comparisons reported. Fifty-nine of these sixty comparisons are in the direction of decrease in mean scores, and this is obviously irrespective of educational attainment during the four-year period. We interpret this to mean that, with young persons who aspire to a college education, there is a change in authoritarianism and intolerance underway irrespective of whether or not the young persons attend college. Perhaps this demonstrates something about the development of authoritarianism (or anti-authoritarianism) and intolerance (or tolerance) in college aspiring and presumably academically able young persons.

There is substantial evidence that intellectual growth continues into the twenties and beyond for those who were shown to be intellectually superior at an earlier age (Bayley, 1957; Bayley and Oden, 1955; Owens, 1953). It may well be that other personality characteristics develop over a longer period of time for those who are intellectually able, and that authoritarianism (or anti-authoritarianism) and intolerance (or tolerance) are examples.

This interpretation of the 1958-1960-1962 comparisons tends to reduce the importance of the collegiate experience upon authoritarianism and intolerance modification. In turn, this may well be a disappointment to some. We find, from our own values perspective, that the interpretation is a positive one as it applies to young persons. It is true that those of our subjects who were enrolled in college for 7 or 8 semesters during the four-year period compared with those who were not enrolled for any semesters during the four-year period started with lower means on the three study scales, and ended the four-year period with lower means. It is also generally true that the net change over the four-year period on these ordinal scales is slightly greater for the enrolled 7 or 8 semester groups compared with the enrolled no semester groups. We have offered a "facilitation effect of the college" interpretation of these results.

Another general observation which may be made of the data reported in tables 24, 25, and 26 is that the female subjects have lower means on the E, F, and D Scales than do our male subjects. There are forty-five male vs. female comparisons which could be made with the data from tables 24, 25, and 26 (i.e. 1958 E-Scale mean of males enrolled 7 or 8 semesters compared with 1958 E-Scale mean of females enrolled 7 or 8 semesters; 1960 or 1962 E-Scale mean comparisons for the same groups). We have not undertaken the forty-five significance tests for uncorrelated means which could be made, but by inspection it is noted that forty-two of the female means are lower than the means for the appropriate male comparison groups. Throughout this study the male vs. female differences in E, F, and D Scale means have been observed. It would seem that research on college effect or impact in institutions having both male and female students need be undertaken for subjects separated into sex groups.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was designed to determine whether or not there were changes in student ethnocentrism, authoritarianism, and dogmatism associated with a two-year and a four-year college experience.

In the spring, summer, and fall of 1958 an "Opinion Questionnaire" was administered to all young persons applying for admission as college freshmen for the fall semester 1958 at San Jose State College. The "Opinion Questionnaire" was comprised of 100 items: 30 from the California Ethnocentrism Scale, 30 from Gough's revision of the F-Scale, and 40 from the Rokeach Dogmatism Scale: Form E. As a result of the 1958 testing, usable responses were obtained from 2,350 would-be college freshmen, none of whom had completed any formal education beyond the twelfth grade.

In the spring of 1960, the same "Opinion Questionnaire" was administered through the mail to these 2,350 1958 subjects, and usable responses were obtained from 1,452 of the original group. Some of the responses had to be eliminated because of enrollment in another college or university of some of the 1960 respondents.

In the spring of 1962, the same "Opinion Questionnaire" was administered through the mail to the 2,350 original 1958 subjects, and usable responses were obtained from 1,058 of the original group. Some of these responses had to be eliminated because of the enrollment in another college or university of some of the 1962 respondents.

At the end of the two-year and four-year periods, it was found that some of the subjects tested in 1958 had not entered

San Jose State College nor any other college or university during the two-year or the four-year period. These "non-college" subjects were considered as one type of comparison group subjects for the study. It was also found that not all 1958 entrants completed the maximum number of semesters possible in the two-year period or in the four-year period. These "some-college" subjects were considered as another type of comparison group subjects for the study. Having groups of subjects differing in amount of educational attainment from 1958 to 1960 and from 1958 to 1962 made it possible for us to assert that this was the only study of which we were aware which included control, or more accurately, comparison groups in the study design. This study design feature made it more possible to determine the impact or effect of the collegiate experience than has been possible from other designs used by other investigators of the problem to date.

After the 1958 testing, comparisons were made between males and females on the E, F, and D Scales. It was found that females had statistically significantly lower means on the E and F Scales than did males. In the light of these significant sex differences on two of the three study scales, all further analyses were made for subjects separated into sex groups.

For the Two-Year Study, subjects were divided into sex and educational attainment groups. There were three groups of males differing in educational attainment during the two years: those enrolled for 4 semesters, those enrolled for 1 to 3 semesters, and those enrolled for 0 semesters. There were three groups of females differing in educational attainment during the two years: those enrolled for 4 semesters, those enrolled for 1 to 3 semesters, and those enrolled for 0 semesters.

To test the Two-Year Study hypotheses that there were no significant differences between 1958 and 1960 means on the E, F, and D Scales for each of the six sex and educational attainment groups, t tests for correlated means were conducted. In all, there were eighteen t tests undertaken, and seventeen reached acceptable levels of statistical significance. All eighteen mean differences were in the direction of lower 1960 than 1958 means. All groups were said to change significantly over the two-year period irrespective of educational experience during the two-year period. Because there were differences in initial status across the groups which differed in educational attainment, acknowledgement was given to the measurement problem arising out of the use of ordinal scales. It was the case though that all groups changed and in the same direction, and we interpreted the results in terms of a "facilitation effect" of the collegiate experience upon a change underway in college aspiring youth irrespective of college attendance.

An analysis was made of the 1958 status of 1960 respondents vs. 1960 non-respondents. This analysis was made for each sex and educational attainment group of respondents vs. non-respondents, and it was found that male respondents were not significantly different in 1958 mean E, F, or D Scale scores from male 1960 non-respondents. The female respondent group of "some college" subjects had significantly lower E and F Scale means than did the "some college" female 1960 non-respondent group, and generalizations for this group are probably restricted by these intial differences in the study variables. There were no statistically significant differences in 1958 E, F, or D Scale means for the female "4 semesters" 1960 respondent group compared with the female "4 semesters" 1960 non-respondent group. There were no statistically significant differences in 1958 E, F, or D Scale means for the female "0 semesters" 1960 respondent group compared with the female "0 semesters" 1960 non-respondent group. Generalizations from the Two-Year Study were not restricted by initial status differences for these two key groups.

Several questions were investigated using all or part of the data from the Two-Year Study, and the results relating to these questions can be summarized as follows:

A. The correlations between A.C.E. Total Raw Score and E, F, and D Scale "Shift-Scores" for all study groups are relatively small. Although the data are only suggestive because "Shift-Scores" involve the measurement problem, it seems that net changes in E, F, and D Scale scores over the two-year period are not significantly related to scholastic aptitude.

B. For those subjects enrolled for 4 semesters during the two-year period, there were significant sex differences in 1958 mean E and D Scale scores, and in 1960 mean E and D Scale scores. In both 1958 and 1960, females had significantly lower E and D scale scores than did males. The F Scale scores were also lower for females in 1958 and in 1960 than for males, but the differences were not statistically significant.

C. 1958 to 1960 comparisons of mean E, F, and D Scale scores were made for forty-nine males who had become members of social fraternities and had been enrolled for four semesters during the two years. It was found that the 1960 means on the F and D Scales were significantly lower than the 1958 means on these two scales. The 1960 mean on the E Scale for these fraternity males was lower than the 1958 E Scale mean, but the difference was not statistically significant.

D. 1958 to 1960 comparisons of mean E, F, and D Scale scores were made for 124 females who had become members of social sororities and had been enrolled for four semesters during the two years. It was found that the 1960 means on the E, F, and D Scales were significantly lower than the 1958 means on these three scales.

For the Four-Year Study, subjects were divided into sex and educational attainment groups. There were five groups of males differing in educational attainment during the four years: those enrolled for 7 or 8 semesters, those enrolled for 5 or 6 semesters, those enrolled for 3 or 4 semesters, those enrolled for 1 or 2 semesters, and those enrolled for 0 semesters. There were five groups of females differing in educational attainment during the four years: those enrolled for 7 or 8 semesters, those enrolled for 5 or 6 semesters, those enrolled for 3 or 4 semesters, those enrolled for 1 or 2 semesters, and those enrolled for 0 semesters.

To test the Four-Year Study hypotheses that there were no significant differences between 1958 and 1962 means on the E, F, and D Scales for each of the ten sex and educational attainment groups, t tests for correlated means were conducted. In all, there were thirty t tests undertaken, and all thirty reached acceptable levels of significance. All thirty mean differences were in the direction of lower 1962 than 1958 means. All groups were said to change significantly over the four-year period irrespective of educational experience during the four-year period. Once again, we offered an interpretation of the results in terms of a "facilitation effect" of the collegiate experience upon a change in authoritarianism and intolerance, a change underway in college aspiring youth irrespective of college attendance over the four-year period.

An analysis was made of the 1958 status of 1962 respondents vs. 1962 non-respondents. This analysis was made for each sex and educational attainment group of respondents vs. non-respondents, and it was found that none of the comparisons for any respondent vs. non-respondent group was statistically significant. These results were taken to mean that generalizations from the Four-Year Study were not restricted by differences in initial status of 1962 respondents and 1962 non-respondents.

Some 1958 to 1960 and 1960 to 1962 comparisons were made to determine something about the possibility of greater change during the first two years of the study or of the last two years of the study. Not all 1962 respondents had responded in 1960 so the number of subjects available for these comparisons was less than for the Four-Year Study. Observations of the 1958 to 1960 and 1960 to 1962 results led to the suggestion that the change in the study variables was probably greater during the first two years of the study than during the last two years of the study.

The most impressive observation of the 1958 to 1960 and 1960 to 1962 comparisons concerned the direction of the differences in E, F, and D Scale means. Fifty-nine of the possible sixty comparisons were in the direction of decrease in mean scores, and this was obviously irrespective of educational attainment during the four-year period. We interpreted this to mean that, with college aspiring youth who are intellectually able, it may be that personality characteristics in addition to intelligence develop over a longer period of time than has been earlier thought to be the case. The collegiate experience seems to facilitate this development.

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APPENDIX A.

One of the secondary questions listed in Appendix A of the current contract had to do with the determination of whether or not there were differences in ethnocentrism between freshman applicants of 1953 and freshman applicants of 1958. E-Scale data were available for 1,028 persons who applied to San Jose State College for admission as freshmen for September 1953. These data were from a 32-item ethnocentrism scale and were rescored on the 30 items which were used as the E-Scale for the present study. Table 27 contains the 1953 data and the 1958 data from the present study for male applicants, and table 28 the data for female applicants.

TABLE 27

E-Scale Statistics for Two Groups of Male Freshman Applicants at San Jose State College, 1953 & 1958

	1953		1958
Number	501		1,007
Mean	89.05		87.50
Sigma	22.80		23.11
St. Error M	1.02		.73
$M_1 - M_2$		1.55	
St. Error Diff. bet. Means		1.25	
t		1.24*	

* Not statistically significant

Male applicants 1953 and 1958 were not significantly different in measured ethnocentrism whereas female applicants 1953 and 1958 were significantly different in measured ethnocentrism.

TABLE 28

E-Scale Statistics for Two Groups of Female Freshman Applicants at San Jose State College, 1953 & 1958

	1953		1958
Number	527		1,343
Mean	85.10		81.70
Sigma	25.50		23.34
St. Error M	1.11		.64
$M_1 - M_2$		3.40	
St. Error Diff. bet. Means		1.28	
t		2.66*	

* P beyond the .01 level of significance

APPENDIX B.

Some opportunity exists to compare freshman groups on non-intellectual variables, and add to the information on heterogeneity of college students. Lehmann and Ikenberry have made freshman data available on the D-Scale for groups of Michigan State University students tested in the Fall of 1958. Foster, Stanek, and Krassowski have made freshman data available for groups of University of Santa Clara freshmen tested with the D-Scale in 1959 and 1961. We have freshman data on the D-Scale also. Table 29 contains summary data for freshman males at S.J.S.C., M.S.U., and U.S.C. Table 30 contains similar data for S.J.S.C. female freshmen and M.S.U. female freshmen.

TABLE 29

D-Scale Means for Entering Male Freshmen at San Jose State College, Michigan State University, and at the University of Santa Clara

D-Scale	SJSC 1958		MSU 1958	USC 1959	USC 1961
Number	778		1,436	287	335
Mean	155.86		168.19	166.0	171.0
Sigma	24.52		25.36	21.62	22.53
S.E. diff. M's		1.23			
$M_{SJSC} - M_{MSU}$		12.33			
t		10.02*			

* P beyond the .01 level of significance

TABLE 30

D-Scale Means for Entering Female Freshmen at San Jose State College and at Michigan State University

D-Scale	SJSC 1958		MSU 1958
Number	1,090		1,310
Mean	154.57		163.56
Sigma	26.36		25.47
S.E. diff. M's		1.06	
$M_{SJSC} - M_{MSU}$		8.99	
t		8.48*	

* P beyond the .01 level of significance

APPENDIX C

During the first two weeks of the fall semester 1958, Gough's California Psychological Inventory was administered to approximately 900 of the subjects of the current study. The resulting C.P.I., E-Scale, F-Scale, D-Scale, and A.C.E. data have been used in several thesis studies. These are listed below.

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